

DRAFT Basis of Preliminary Estimate for Dredging of PCB Contaminated Sediments from Portage Creek, Kalamazoo, MI

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DATE:

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PROJECT NUMBER:

365780.DE.01

Purpose

The United States Environmental Protection Agency (USEPA) requested that CH2M HILL provide a Class 4 cost estimate for remediation of the section of Portage Creek from Alcott Street to the confluence of the Kalamazoo River in Kalamazoo, Michigan. The purpose of this estimate is to provide a Class 4 rough-order-order-magnitude (ROM) evaluation of costs to perform removal of polychlorinated biphenyl (PCB) contaminated sediments at a range of removal levels including 80, 40, 20, 10 and 5 parts per million (ppm).

Project Description

In 2009, the Millennium LLC performed soil and sediment coring of the section of Portage Creek extending from Alcott St. to the confluence with the Kalamazoo River. Data from the 2009 sampling was analyzed and reported in "Portage Creek Estimation of Volume of Contaminated Sediment and PCB Mass from 2009 Sediment Sampling", Field Environmental Decision Support (FIELDS), June 4, 2010. This report provided computer generated plan views depicting contaminated segments of Portage Creek by PCB concentration in the sediment at 80, 40, 20, 10, 5 and 1 ppm.

USEPA requested CH2M HILL provide a Class 4 cost estimate utilizing the volumes generated by the FIELDS Group. A Class 4 estimate is identified by the American Association of Cost Engineers C18R-97 as generally a study or feasibility cost estimate completed with 1% to 15% of the design information and has an expected level of accuracy of -30% to +50%.

The following activities were included in the development of the cost estimate:

- Design
- Project management
- Access agreement negotiation
- Permitting
- Field engineering
- Construction management
- Data management
- Dredging, stabilization and disposal of contaminated sediment
- Collection and management of free water generated during mechanical dredging and
- Site restoration

The estimate has been developed to provide the USEPA with preliminary costs in current dollars (2010), since the specific time frame and methodology have not been determined. (Table 1)

TABLE 1 Class 4 Cost Estimate

	80 ppm PCB Removed	40 ppm PCB Removed	20 ppm PCB Removed	10 ppm PCB Removed	5 ppm PCB Removed
Estimated Cost	\$1,000,000	\$2,700,000	\$4,600,000	\$5,800,000	\$7,500,000
+50%	\$1,500,000	\$4,000,000	\$6,900,000	\$8,600,000	\$11,000,000
-30%	\$700,000	\$1,900,000	\$3,200,000	\$4,00,000	\$5,200,000

Cost Estimate Methodology

This estimate is based on the following general assumptions:

- 1. Mechanical dredging of all sediments to load transfer areas. These areas will consist of water tight mixing boxes located within contained lined areas.
- 2. Free water removal and solidification of sediments in the load transfer area to pass the paint filter test
- 3. Access (easement) agreements can be obtained for mechanical dredging of all contaminated sediments
- 4. Protected and endangered species are not present or can relocated if they are disturbed by the dredging activities
- 5. Turbidity control is based on installation of a silt curtain downstream of the active dredging area and utilization of an excavator equipped with an environmental bucket. Turbidity monitoring performed upstream and downstream during active dredging operations. Assumed standard background plus 30 ntu.

In addition, the following notes apply to the estimate:

 Technical Tasks — Design, project management, permitting, field engineering, construction management, data management, and in-situ characterization were all estimated using parametric multipliers. This estimating technique uses a statistical relationship between historical data and other variables (i.e., site conditions) to calculate an estimate for activity parameters, such as scope, cost, budget, and duration.

- Quantities Quantity take-offs for volume of sediment removal were calculated based on the Figures 2 a/b, 3 a/b, 4 a/b, 5 a/b and 6 a/b provided in the FIELDS report. These figures depict plan views only and were hand scaled for estimating purposes. Key volumes and quantity assumptions are shown in Attachment C, Data Assumptions. Estimated quantities reflect an over dredge allowance of 6 inches. Volume to mass conversion was performed based on an assumed density conversion of 1.5 tons/cubic yard of sediment. No quantity estimate was prepared for removal of less than 5 ppm PCB contamination.
- Costs Construction cost was estimated by generating "Estimated Unit Prices" for
 various tasks that are anticipated to occur during dredging. Appropriate counts and
 calculated amounts were applied to those unit price estimates for each PCB removal
 level specified. Design, engineering, project management and construction
 management costs are based on parametric methods. The estimated costs include a
 15% contingency to account for unidentified elements of the scope of work. The
 tasks for which Unit Prices were estimated are presented in Table 2.
- Transportation and Disposal of sediments with PCB concentrations above 40 ppm were assumed at EQ (Wayne Disposal) located in Belleview, Michigan. Disposal of sediments with PCB concentrations less than 40 ppm were assumed at Republic Services KL Subtitle D landfill located in Kalamazoo, Michigan. Waste characterization data was not available for preparation of the estimate.
- Estimated Unit Prices were developed by building up crews for the activities and setting nominal production rates based on estimator experience. Prices for transportation and disposal were estimated from preliminary vendor cost information.
- Site Restoration pricing is based on a potential approach of tree planting and sod installation in all areas disturbed by the dredging.
- Allowances Contingency for area difficulty, yet undefined scope or unforeseen site
 conditions, project management, remedial design and construction management
 have been included in the estimate summary as parametric multipliers.

In addition to generating an estimate for mechanical dredging, CH2M HILL also reviewed general costs for hydraulic dredging with sediment dewatering and water treatment. This approach may be competitive for removal of 10 ppm PCB or lower concentrations. Potential non-cost related drivers to choose hydraulic dredging: inability to obtain access agreements, water treatment systems set-up location and/or the preservation of the Creek banks. If desired, CH2M HILL will develop estimated costs for this approach.

TABLE 2 Unit Cost Tasks

ID	DESCRIPTION	COMMENTS
1a	WORK PLAN	General cost level based on CH2M HILL experience
1b	HEALTH & SAFETY PLAN	General cost level based on CH2M HILL experience
1c	ACTIVITY HAZARD ANALYSIS	General cost level based on CH2M HILL experience
1d	SAMPLING AND ANALYSIS PLAN	General cost level based on CH2M HILL experience
1e	QA/QC PLAN	General cost level based on CH2M HILL experience
G01	MOBILIZE DREDGING SUB TO FIRST AREA	Assumes cost for initial mob of all equipment to an area
G02	CLEARING CREW COST	Cost for clearing and tree/brush removal for perpendicular dredging access
G03	MECHANICAL DREDGING CREW	Cost for sediment removal based on 150 cy/day production
G04	SOLIDIFICATION COSTS	Cost for sediment solidification in mix boxes located in the dredging area with superabsorbent polymer/Portland cement blend based on 150 cy/day production
G05	BRIDGE CLEARING RESOURCES	Cost for sediment removal with modified horizontal drill equipment based on 50 cy/day production
G06	WATER HANDLING CREW	Cost for sediment free water removal based on 10% of environmental bucket capacity production
G07	SURVEYING CREW	Estimated cost for daily bathymetric survey crew to confirm existing sediment cut lines and removal depths
G08	STREAM RESTORATION COST	Assumes 10 trees/100 ft and sod installation over disturbed areas
G09	MOT COST	Based on visual counts of areas where Maintenance of Traffic may be required
G10	MONITORING RESOURCES COST	Assumed cost for daily air and water quality monitoring
G11	T&D COST (TSCA)	Assumed for T&D at EQ, Belleview, MI
G12	T&D Cost (non-TSCA)	Assumed Republic Services, Kalamazoo, MI
G13	REMOB TO NEW AREA COST	Cost to shift the dredging operation over a street
G14	ACCESS AGREEMENT NEGOTIATION	Based on counts of potential access agreements required. No list was provided so these counts are best guess
G15	T&D/WATER TREATMENT OF FREE WATER	Cost for T&D of free water collected in load transfer tanks
G16	SHIFT DREDGING EQUIPMENT	Cost to shift the dredging operation 100 ft

Exclusions

- Removal and replacement of outfall and other piping structures could not be
 estimated based on the currently available information and therefore such costs are
 assumed to be accounted for in the contingency cost allowance.
- Costs for payment and performance bonds have not been included.
- Costs have not been escalated for out year construction implementation (beyond 2010)
- No backfill or stream bed covering/capping has been included in the ROM cost.
- No relocation or replacement of utilities located within Portage Creek dredging zones.
- Costs for negotiation with Railroads and excavation under railroad structures have been included. However, these costs are subject to significant change and/or the work being excluded from the scope.
 - Traffic management beyond site exit as defined above or local permitting requirements yet undefined.
- Removal of stumps and root systems from stream banks were not included.

General Notes

The estimates contained in this report have been produced using one or more of the following methods:

- Comparison with similar work performed by contractors, with material and labor adjustments based on observed or perceived site conditions and/or on information provided by local engineers or operators of the facilities that have been surveyed
- Facility cost/capacity ratios, with adjustments for site conditions
- Ratio methods, using known material/equipment costs as guides

Only the basic parameters for performing the work have been determined; final methodology will impact the ultimate cost for project execution. Based on the Class 4 estimate classification, expected final methodology cost will be within the plus 50% to minus 30% of the ROM estimate cost.

Detailed cost estimates (Class 3) can only be developed by performing sufficient engineering and design to define the scope for discrete projects. Once detailed designs are developed, then detailed engineer's estimates can be performed and bid specification packages can be put out for competitive bidding.

The purpose of these estimates is to assist in establishing priorities for decision-making and to aid in evaluating the potential cost of performing the tasks identified. These estimates cannot be relied upon to establish funding levels for individual tasks, as neither preliminary nor detailed design engineering has been performed in sufficient detail to provide sediment

quantities, TSCA/Non-TSCA contamination and/or sediment characterization from which to develop budget funding estimate (AACE Class 3). Soils reports and other environmental information have not been available.

Therefore, caution should be used in utilizing these rough order of magnitude numbers for anything other than preliminary evaluation and planning purposes. Once the priorities have been established, the traditional engineering, procurement and construction process of design, bid and build can be followed.

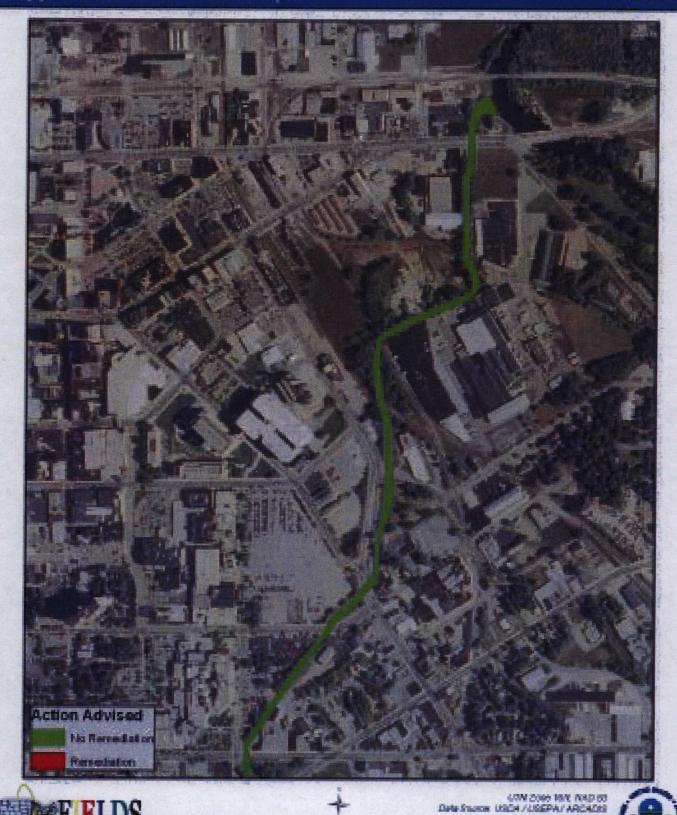
Attachment A Applicable Drawings

PORTAGE CREEK DREDGING

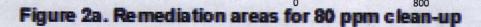
DRAWING NOTES

ARM Jacone Source

Map Author: Wike Weite



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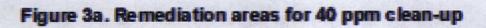




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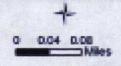


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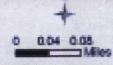


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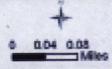


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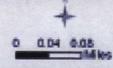


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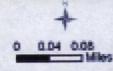


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OTM Zone 16A 6AD 63 Cela Scarce: USDA / OSSSA/ ARCAZAS APAL James Serio Map Author Mills Majac









UTM Joile FRIL, NAD 195 Data Source: CISCA / USEPA / ARCADIS APRIL James Sant Wap Autor: Wile Wejsc



Attachment B
Cost Estimate Summary

agnitude (ROM) Estimate

PCB contaminated sediments per drawings provided in Volume Estimate for 2009 Sediment Sampling ifts pptx for Area Information

assumed to be Mechanical

reements for dredging can be obtained station can be removed to allow for perpendicular access to the dredging seneral Task Details sheets 1 and 2 for further information

			80 ppm F	80 ppm PCB Removal	7	40 ppm PC	PCB Removaí	20 ppm P	20 ppm PCB Removal	10 ppm PC	10 ppm PCB Removal	7 4	5 nnm PCR Removal		
	General Unit Cost	Unit	Rough Quantity		ROM Cost Estimate	Rough Quantity	ROM Cost Estimate	Rough Quantity	ROM Cost Estimate	Rough Quantity	ROM Cost Estimate	Rough	ROM Cost Estimate		§
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PREPARATION and PERMITS														_	İ
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	\$ 71.88	\$ALF	100 1	*	7,188	350 #	\$ 25,156	1,555 If	111,766	2,947 Ⅱ	\$ 211,816	3,923 If	\$ 281,966		ener
REW	\$ 35.42	\$/C	/ 1,203 cy	8	42,603	3,931 cy	\$ 139,222	9,682 cy	342,880	13,146 cy	\$ 465,555	18,942 cy	\$ 670,849	+	ener
	\$ 20.19	\$Mon	1,859 ton	\$ U	37,531	5,148 ton	\$ 103,962	13,148 ton	285,464	16,874 ton	\$ 340,749	24,298 ton	\$ 490,660	+	enera -
RCES	\$ 160	\$CY	/ 444 cy	\$	71,212	561 cy	\$ 89,846	1,134 cy	181,769	1,183 cy	\$ 189,543	1,551 cy	\$ 248,501	+-	eners
ŕ.	\$ 2,412	\$/day	y 8 day	y \$	19,342	26 day	\$ 63,208	65 day	155,671.45	88 day	\$ 211,367	126 day	\$ 304,573	-	anet.
	\$ 2,885	\$/Day	y 8 day	9	23 137	26 day	\$ 75,608	65 day	186,210.72	. 88 day	\$ 252,833	126 dey	\$ 364,324	-	eners
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	\$ 9,441	LS.	1.00 ea	•	9,441	3.00 ea	\$ 28,324	5 68	47,207	5,00 es	\$ 47,207	8:00 64	\$ 75,531	_	ener
COST	\$ 696	\$/Day	y 12 day	*	8,378	39 day	\$ 27,377	97 day	67,426	131 day	\$ 91,549	189 day	\$ 131,920	_	ener
	\$ 179	\$70m	n 1,859 ton	\$	332,802	5,149 ton	\$ 921,993	5,149 ton	921,993	5;149 ton	\$ 921,993	5,149 ton	\$ 921,993	-	ener
	\$ 28	#YTon	n - ton	*	1	- ton		7,997 ton	209,920	11,725 ton	\$ 307,784	19,149 ton	\$ 502,857	_	ener
ST	\$ 5,630	ĘŞ	3 -	*	~16,890	10 ea	\$ 56,301	21 ea	118,232	29.00 89	\$ 163,273	39 68	\$ 219,574	_	
OTIATION	\$ 14,375	Fis	2 88		28,750	4 68	\$ 67,500	89	115,000	13 ea	\$ 186,875	13 ea	\$ 186,875		- energ
JF FREE WATER	0 \$	\$/Gal	l 48,119 gal	•	21,653	157,244 gal	\$ 70,780	387,267 gad	174,270	611,230 gal	\$ 230,053	726,81:1 gal	\$ 327,065	_	enera
INE	\$ 6,200	Si	1 68	•	6,200	10 ea	\$ 82,000	10 ea	62,000	10.88	\$ 62,000	10 ea	\$ 62,000		eners
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x Cost		\$ 714,022		\$ 1,872,160	**	\$ 3,244,809	&	\$ 4,029,305	•	5,238,643	
	2%	\$ 35,701		\$ 93,608	69	162,240	·,	01,465	•	261,932	
	15%	\$ 107,10	.	\$ 280,824	.	486,721	Б	604,396	69	785,797	
SUBCONTRACT VALUE		\$ 856,826	40	3,246,592	₩ ₩	3,893,771	. 4	4,835,166	•	6,286,372	
L SERVICES CAPITAL COSTS						•					
	3%	\$ 25,70	10	862,398	69	116,813	(A	145,055	ss.	188,591	77.7
	10%	\$ 85,683	m	\$ 224,659	6 9	389,377	4	483,517	€9	628,637 CCI Historic	
. sent	5%	\$ 42,841		112,330	69	194,689	44	241,758	69	314,319 CCI Historic	CI Historic
anagement		154,229	•	404,387	•	700,879	40.	870,330	•	1,131,547	
רתב	-	1,011,055	15	2,650,979	4	4,594,650	5,7	5,705,495	•	7,417,919	
- 30%	į										
20%	%0g	1,516,582	د.	3,976,468	*	6,891,975	80,	8,558,243	٠ ب	11,126,879 ROM Level	ROM Level
%0°- ei	~30%	5 707,738	~	1,855,685	•	3,216,255	3,9	3,993,847	•	5,192,543 ROM Level	ROM Level
,											

exclusions are provided for this estimate under a separate sheet and should be read in conjunction with this estimate

HATA and ASSUMPTIONS

Lower Upper

rom estimate disclaimed

ortage Creek Mechanical Dredging Class 4 ROM Price lough Order of Magnitude Estimate (alamazoo, MI

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VERALL ASSUMPTIONS FOR THIS ROM

- 1 UNION LABOR
- 2 Mechanical Dredging 3 Provide estimate for removal of >80 ppm; >40 ppm; >10ppm; >10ppm; >5 ppm PCB

Jata and Assumptions Summaries

JENERAL SCOPE OF WORK TO PERFORM

Mechanically dradge PCB conta

assumes that all work is performed from the land except cleaning in culverts and under bric

assumes that dredged sediments will be mixed with pozzolagn before shipment to permitted

Nork in any area may include the following task

JOBILIZE DREDGING SUB TO FIRST AREA CLEARING CREW COST

MECHANICAL DREDGING CREW SOLIDIFICATION COSTS BRIDGE CLEARING RESOURCES WATER HANDLING CREW

URVEYING CREW

IREAM RESTORATION COST IOT COST

IONITORING RESOURCES COST ab cost (TSCA)

TAD Cost (non-18CA) REMOB TO NEW AREA COST ACCESS AGREEMENT NEGOTIATION TADWATER TREATMENT OF FREE WATER

ROJECT DRAWINGS and SKETCHES Used in this ROM

Please refer to "Portage Creek Estimation of Volume of Contaminated Sediments and PCB Mass from 2009 Sampling", field Environmenta Decision Support, 2009 Dredging Area Lifts.pptx

3LOBAL MULTIPLIERS and RATES USED IN ROM CALCULATIONS

·		Sub:Labor	ō		
Vages in Estimate		Multiplier	Ē		1.15
	Rate	FR	Ι	S	Cost
)perator (All)	\$ 30.12	\$	7.80	\$	55.11
Iperator OT (All)	\$ 45.18	\$	87.8	\$	59.75
abor (All)	\$ 20.57	\$	9.88	\$	35.02
abor OT (All)	\$ 30.86	\$	4.63		40.81
Sectrician ST	\$ 30.00	*	15.02	\$	51.77
Sectrician OT	\$ 45,00	\$	5.47	\$	69.54
Humber ST	\$ 30.50	\$	14.10	*	51.29
Number OT	\$ 45.75	\$	21.15	•	76.94
Surpenter ST	\$ 23.26	. \$	11.15	\$	39.57
arpenter OT	\$ 34.89	\$	16.73	•	59.36

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	,		-		% 0.0 % 0.0		%0.0 %0.0	% 0.0 % 0.0	200
				Resource	Labor 1	Labor 2	2nd Tier Sub	000	Disposo
inbcontractor Markup Assumptions				Code		2	3	7	4

Markups Summary (USED ON.PM Resources Cost Sheet)

			11.7%	11.7%	11.7%	11.7%
	Confingency	%0	% 0	%0	% 0	%0
	Fee	7%	.7%	7%	7%	7%
	Fringe	0.319	0.395	-		•
	Resource	CCI Labor	INC Labor	Subconfractor	ODC (CHSM HILL)	Disposel
MRKUPS (Multipliers)	Code	1	2	3	4	5

akeoff (ROM PURPOSES)

fass Balances of Dredge Material

ENERAL MASS BALANCE ASSUMPTIONS

ssumed Bulk Density ssumed Overdredge ssumed Solidification Ratio ssumed Free Water Generation
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ned Bulk Density	1.5	tori/cy	Based on high e	nd estimate for	Based on high end estimate for similar sediment		
ned Overdredge	0.5	0.5 ft	Typical specification for sediment dredging	ition for sedime	nt dredging		
ned Solidification Ratio	3%		Estimate based on other projects	on other project	,		
ned Free Water Generation	40	40 gal/cy	Based on 10% of 2 cy bucket	of 2 cy bucket			
					, ,		
	PRELIMI	PRELIMINARY DISTANCES, WIDTHS, DEPTHS and VOLUMES	S, WIDTHS, DEI	PTHS and VOL	UMES		Γ
	Stream Distance	Stream Width	Surface Area	Est Ave Sediment	Feet Sections 1	3	
Location	(ft +/-)	(H +/-)	(acre)	Depth (ft)	Volume (cy)	(tons)	
to to Describe to Delater	1 1						П
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Strange Strange	87.6	92		0.0	700		= 8
Ave Bridge	99			0.5			ş Ş
Ave Bridge to Reed Ct Bend	712		0.33	0.71			1 29
Ct Bend to RR Bridge 1	276			0.71			218
dge 1	37			0.71	19		8
dge 1 to Stockbirdge	248		0.11	0.71	130		98
vidge Bridge	. 67		E0.03	0			,
ridge to Lake St	931			2.25		2,	2,328
st Bridge	46		0.02	3	102		163
it to E Crosstowni Pkwy	980			4.25	4,628	9	6,942
stown Pkwy Bridge (2 x 6 ft comgated)	100			4.25			90
stown Pkwy to E Vine St	380		96.0	4.25	2,456	9	3683
St Bridge	67			2.1	807		313
St to E Dutton St	361			3	1,123	-	1,685
on St Bridge	58			2	741		213
on St to Walnut St	484		0.41	4.5	2,985	4	4 477
l St Bridge	. 72			6.25		-	1.050
t St to Portage St	270			5.5		3	485
e St Bridge	80			5.5	554		8
e St to S Pitcher	723			5.5		5	5.523
ver Bridge	65			4.5			8
ver to RR Bridge 2	334		0.19	2.75		7	1.276
dge 2	65		0.04	2.5			82
dge 2 to RR Bridge 3	405			2.5	3	-	1406
idge 3	30			2.5			₫
dge 3 to RR Bridge 4	1677		0.91	2.5	3,6	5	5,476
idge 4	30			2.5	69		ᅙ
dge 4 to E Michigan	652			3.5	2,536	3	3,803
igan Bridge	87			3.5	338		80%
Igan St to Confluence	286		0.33	3.5	1,89,1	2	2.836
	10889		6.67		32,886	49	49,328

Values estimated from - Portage Creek Longitudinal Profile - Arcadis 8/21/2008

Stream Width Surface Area Sediment Est Ave Stream Width Surface Area Sediment (ftt) Volume (cy) (cs) 30 0.07 3.5 389 389 30 0.07 3.5 389 389 390 0.05 3.5 3.5 389 389 390 0.05 3.5 3.5 389 389 389 389 389 389 389 389 389 389				SALL MET OF REMOVAL CAREON	2	1							
Location (ft +i-)	S. C. March	- Stream Will			Est Ave	Est Codimont		70	Clearing For		ā	Est	Est Free Water
Ave Ave Ave Read CI Bend RR Bridge 1 RR Bridge 2 Rom Pkwy File Si An O OO7 3.5 389 An O OO5 3.5 389 An O OO5 3.5 375 Rton St e intu St e intu St A Bridge 2 R Bridge 3 R Bridge 4 R Bridge 3 R Bridge 4 R Bridge 4 R Bridge 4 R Bridge 5 R B		(tt +/-)		_=		Volume (cy)		(tons)	Dredge (ff)	Restoration (If) And	Agent Steno	(ton)	Generation (Get)
Ave Ave I Ave			_						l		ı		
Need CI Bend Need CI	өбр		-										
New Confluence		_	L	-									
In Read CI Bend CI Bend CI Bend Cockbirdge 1 Cockbirdge Cockbirdge CI As Machigan CI As Michigan CI Bend CI B			L										
Fleed Ci Bend Fleed Ci Bend Fleed Ci Bend Fleed Ci Bend Fleed			-	ľ			-						
RR Bridge 1 cdbirdge cdbirdge le stown Pkwy 100 30 0.07 3.5 389 y Bridge (2 x 6 ft corrugated) 100 30 0.07 3.5 389 y Lo E Vine St 53 40 0.05 3.5 275 Iton St e 3.6 275 Iton St e 100 30 0.07 3.5 275 Iton St e 100 30 0.07 3.5 275 Iton St e 100 30 0.05 3.5 275 Iton St e 100 30 0.05 3.5 275 Age St e 100 100 0.05 3.5 275 Itcher e 100 100 0.05 3.5 275 Age St e 100 100 0.05 3.5 275 Age St e 100 100 0.05 3.5 275 Agidge St e 100 100 0.05 3.5 275 Agidge St e 100 100 0.05 3.5 275 Agidge St e	Ci Bend		L										
to debirdge fee from Plewy for E Vine St from St fee finth St finth St<	9.1		\vdash										
ele ke & St ke & St stown Pkwy 100 30 0.07 3.5 389 y to E Vine St 63 40 0.05 3.5 275 tton St 40 0.05 3.5 275 tton St 6 3.5 275 tto E Vine St 6 3.5 275 tton St 7 8 8 tton St 8 8 8			_	-									
te Si ke Si ke Si ke Si ke Si ke Si ke Si stown Pkwy 100 30 0.07 3.5 389 7 Evidge (2 × 6 it corrugated) 100 30 0.07 3.5 389 2 Si tton St tton	6		-										
ke Si stown Pkwy 100 30 0.07 3.5 389 y Bidge (2 × 6) corrugated) 100 30 0.07 3.5 389 tton St 40 0.05 3.5 275 tton St 6 3.5 275 inton St 6 3.5 275 inton St 6 3.5 275 into E Vine St 6 6 6 into E Vine St 6 6 6 into E Vine St 6 6 7 into E Vine St 7 7 7 into E Vine St 7 7 7 into E Vine St 7 7 7 into E Vine S			H										
Stown Pkwy 100 30 0.07 3.5 389 Y Bridge (2 x 6 R corrugated) 100 30 0.07 3.5 389 Y LoE Vine St 6 3.5 3.8 389 Atton St 6 3.5 275 age St 6 3.5 275 age St 6 3.5 275 Itcher 7 10 10 Interest 8 10 10 10 A Bridge 3 8 10 10 10 B 10 10 10 10 Conflictence 10 10 10 10			-										
strown Pkwy y Bridge (2 × 6 ft corrugated) 100 30 0.07 35 389 40 0.05 35 375 375 375 375 375 375 37			-	-									
y Bridge (2 × 6 ft corrugated) 100 30 0.07 3:5 389 Y LOE Vine St 40 0.05 3:5 275 Iton St 10 0.05 0.05 0.05 Iton St 10 0.05 0.05 0.05 0.05 Iton St 10 0.05 0.05 0.05 0.05 0.05 Iton St 10 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05 0.05	ZW:	100	8	70.0	3.5		444		99	100	Ŕ	687	17 778
Y to E Vine St 40 0.05 3.5 27.5 It on St 40 0.05 3.5 27.5 It on St 10	(2 x 6 ft corrugated)	100	S	0.07	3.5		4	199			20	289	17.778
tton St e infut St age St age St ticher ridge 2 A Bridge 3 A Bridge 4 Confluence	16.St	63	4	0.05	3.5	-	314			53		ARK	12 583
Higher St. Age St. Itcher I			L										
			\vdash										
			-										
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2007			H										
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2007 7			L	- 				[. [.					
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2007			L										
2007 7 2002	3		H	-									
2007 7 2002			L					-					
2007	4		-					-					
383 0.40			-										
orfillence				 									
230-7 0 20													
C3U-1	63		H										
630:1			Ц										
0.18		253		0.19		1,053	1,203	1,804	100	153	2	1,859	48.119

anues estimated irom - Portage Creek Estimation of Vorimes - Arcadis C44/2010

EAWNIRIVER DREDGING	(see disclaimer)

DATA-ASSUMPTIONS (PORTAGE)
Portage Creek Dredge Class 4 ROM!(7-07-10) v2 (fer djc) (version 1);xlsb

	i			Est Ave		Total +		Clearing For			Est Disposal	Est Free
Location	Stream Distance (ft +/-).	Stream Width (ft +/-)	Surface Area (acre)	Sediment Depth (R)	Est Sediment Volume (cv)	Overdredge:	Est Mass	Mechanical Drades (f)	Site Bostoration (ff)	Agent Blend	Mass	Generation
									In the man		(IIOII)	
Alcott St to Bryant St Bridge												
yant St Bridge												
yant St to Reed Ave							·					
sed Ave Bridge												
sed Ave Bridge to Reed Ct Bend												
red Ct Bend to RR Bridge 1												
3.Bridge 1							•					
Ridge 1 to Stockbirdge												
ockbridge Bridge												
ockbridge to Lake St	100	20	0.05	0.5	37	74	T.	45	Ş	1 07	ŀ	
ke St Bridge	23			0.5		4	1	3		0.0	/4	2,963
ke St to E Crosstown Pkwy	200	œ	0.14	3.5	877	ABO	1 167	OÓC		80.30	2 3	8
Crosstown Pkwy Bridge (2 x 6 ft corrugated)	100	30		3.5		444	189	3		30.65	1,202	956,55
Crosstown Play to E Vine St	390	9		35	ľ	2 311	3,033		1	8.7	5	1/,/18
Vine St. Bridge	18	\$		90		8	2000		ORE	91.00	3,124	92,444
Vine St to E Dufton St	75			0.5	9	282	62			2,43	> (3,970
Dutton St Bridge						2	8		2	1./3	3	3,111
Dutton St to Wahut St												
alrut St Bridge												
alnut St to Portage St												
irtage St Bridge												
ritage St to S Pitcher												
Pitcher Bridge												
Pitcher to RR Bridge 2												
₹ Bridge 2												
Ridge 2 to RR Bridge 3												
₹ Bridge 3												
Ridge 3 to RR Bridge 4												
3 Bridge 4												
Ridge 4 to E. Michigan												
Michigan, Bridge												
Michigan St to Confluence	50	10	0.01	0.5	6	19	14	52	2	0.42	3	744
										31.5		Ē
	1005		0.74		3,332	3.931	4 998	360	R45	440 DK	£ 140	467.044

ss estimated from - Portage Creek Estimation of Volumes - Arcadis 6/4/2010

		ZO PPM PC	B REMOVAL CHECK	ECK								
	Stream Distance	Stream Width	Surface Area	Est Ave Sediment	Ext Sediment	Total +	Fet Mass	Clearing For		Amond Blanch	Est Disposal	Est Free Water
Location	(ft +/-)		(acre)	Depth (ft)	Volume (cy)	(cy)	(tons)	Dredge (sf)	Restoration (If) Amt	Arret (ton)		(pag)
										ı		
Alcott St to Bryant St Bridge	125	20	90'0	0.5	.94	- 93	89	125	125	208	72	3704
ryant St Bridge								,				
ryant St to Reed Ave] . 					
eed Ave Bridge					 -].					
eed Ave Bridge to Reed Ct Bend	125	19	0.03	0.6		46	8		125	2	55	1 852
sed Ct Bend to RR Bridge 1											3	3001
R-Bridge 1					•							
R Bridge 1 to Stockbirdge												
tockbridge Bridge												
tockbridge to Lake St	100	20	90.0	4	296	333	444	130	100	13.33	458	13 333
ake St Bridge	23	20	0.01	4	8	11	102			3.07	105	3.067
ake St to E Crosstown Pkwy	425	8	0.29	4	1,889	2,125	2.833	425	425	85.00	2 918	85,000
Crosstown Pkwy Bridge (2 x 8 ft corrugated)	100	30		4	444	909	199			20,00		20,000
Crosstown Pkwy to E Vine St	380	40	0.36	4	2,311	2,600	3.467		390	102.00		104 000
Vine St. Bridge	29	9	90:0	4	397	447	296			17.87	613	17 867
Vine St to E Dutton St	75	28		4	311	350	487		75	14.00	481	14 000
Dutton St Bridge		33										
Dutton St to Walnut St		37	-									
fallrut St Bridge		42										
Aslmut St to Portage St		42	ŀ									
ortege St Bridge		8										
ortage St to S Pitcher		25	1				 					
Pitcher Bridge		25	,		•							
Pitcher to RR Bridge 2	200	25	0.11	3.5	848	741	972	200	200	29.17	1.001	29.630
R Bridge 2		25	-	3.5	-		•					
R Bridge 2 to RR Bridge 3	405	25	0.23	3.5	1,313	1,500	1,969	405	405	90.08	2.028	90 000
R Bridge 3	30	25	0.02	3.5	26	111	146			4.38		4 444
R Bridge 3 to RR Bridge 4	125	25		3.5	405	463	909	125	125	18.23		18,519
R Bridge 4		25	-	3.5			1					
R Bridge 4 to E Michigan	125	10	0.03	3.5	162	185	243	125	125	7.29	250	7.407
Michigan Bridge		30		3.5	•							
Michigan St to Confluence	90	15	0.05	3.5	97	141	148	S	50	4.38	150	4,444
												!
	2365		34.		8,509	9,682	12,763	1.555	2.145	ON CRE	13 146	347 287

,	:	10 PPM PC	10 PPM PCB REMOVAL CHECK	HECK								
	Stream Distance	Stream Windth	Sinface Area	Est Ave	9	Total +	:	Clearing For	``		Est Disposal	Water
Location	(ft +/-)		(acre)	Depth (ft)	Volume (cv)	Cyandada (cy)	(tons)	Mechanical Drados (ef)	Site Ager	₩	Mass	Generation
								(in all and	neeror anon III)	Amir (too)	(LOU)	
Alcott St to Bryant St Bridge	368	20	0:17	0.5	138	272	188	900				
yant St Bridge						2/2	3	8	88	6.13	211	10,904
rant St to Reed Ave												
ed Ave Bridge												
ed Ave Bridge to Reed Ct Bend	175	100	, 200	72.0		İ						
ed Ct Bend to RR Bridge 1			5	V.7.1	8	R)	8			2.07	14	3,137
₹ Bridge 1					·					,		
Ridge 1 to Stockbirdge												
ocidyridae Bridge	-											
actividae to Lake St	900						-					
to Ot Distance	7007	16		3	333	386	500			15.00	646	46 550
Ke or proge	46	20	0.02	8	701	119	163			307	010	000
ke St to E Crosstown Pkwy	454	25	0.28	3	1 261	1 471	1 803	45.4		3	PC.	4//0
Crosstown Pkwy Bridge (2 x 6 ft corrugated)	100	30		2.0	380		700	\$	404	8	1,948	58,862
Crosstown Pkwy to E Vine St	380	Q.		2 0	000		2	00		17.50	601	17,778
/ine St Bridge	23			200	7077	116.2	3,033	390	380	9.8	3,124	92.444
fine St to E Dutton St	200	3		3.5	347	397	521			15.63	537	15 BR1
Little Ct Bridge	₩	28	0.26	3	1,244	1,452	1,867			9	1 893	58 07A
Julium of Brigge		33			•						C361	10,00
Jutton St to Walnut St	920	37	0.04	e	208	240	308	S	5			
afrut St Bridge		42					000	8	8			
ainut St to Portage St		40										
rtage St Bridge		25										
rtage St to S Pitcher		, Y			,							
oftcher Bridge		3 46										
Atcher to RR Bridge 2	220	7,4	0.43		. 75	12						
Bridge 2	8	35		*	610	/16	1222	220	220	36.67	1,259	38,667
Bridge 2 to RR Bridge 3	37.0	200		3		22	167	30				
Ridge 3	0/0	2 2			1,875	2,188	2,813	675	675	84.38	2.897	87 500
Bridge 2 to DD Didge 4	3	22		9	8	97	125	8		3.75	130	3 880
Price 4	3	25		3	417	486	625	150	150	18 75	770	
Corrupt of	8	25		6	88		125	ş			5	2
brage 4 to E. Michigan	300	30	0.21	6	1,000	1 167	150	9	250	37		
Aichigan Bridge		30	,	6				3		45.W	1340	46,667
Aichigen St to Confluence	55	53	0.18	~	S	8	1326	1				
						200	1,273	2	150	38.25	1,313	39,667
	3835		2.38		300 11							

Le strange estrolly

		5 PPW PC	W PCB REMOVAL CHECK	HECK								
				Est Ave		Total +		Clearing For			Est Disposal	Est Free
Location	Stream Distance (ft +/-)	Stream Width (ft +/-)	Surface Area (acre)	Sediment Depth (ft)	Est Sediment Volume (cy)	Overdradge (cy)	Est Mass (tons)	Mechanical Dredge (sf)	Site Age Restoration (sf) Amt	Agent Bland		Generation (cod)
				Г						l		
About St to Bryant St Bridge	388	22	0.17	0.5	136	273	202	368	388	8.13	211	10.804
3ryant St Bridge												
Bryant St to Reed Ave	300	10	20.0	0.5	98	111	8	300	300	2.50	æ	4 444
Reed Ave Bridge											3	
Reed Ave Bridge to Reed Ct Bend	300	10	0.07	0.71	79	134	118		-	3.55	122	5.378
Reed Ct Bend to RR Bridge 1			-									
RR Bridge 1										ŀ		
RR Bridge 1 to Stockbirdge			-									
Stockbridge Bridge			-									
Stockbridge to Lake St	931	91	0.32	E	1,552	1,810	2,328			69.83	2 397	72 411
Lake St Bridge	46	20		3	102	119	163			4.60	158	4.770
ake St to E Crosstown Pkwy	086	20	0.45	3.5	2,541	2,904	3,811	086	086	114.33	3,925,	116 148
E Crosstown Pkwy Bridge (2 x 6.ft corrugated)	100		0.07	3.5	389	444	583	100		17.50	9	17.778
E Crosslown: Pkwy to E Vine St.	390	07	0.36	3.5	2,022	2,311	3,033	380	380	91.00	3.124	92 444
E Vine St Bridge		019		4	397	447	969			17.87	613	17.867
E Vine St to E Dutton St	400	28	0.26	7	1,659	1,867	2,489			74.67	2,564	74,667
E Dutton St Bridge		33			-		•					
E Dutton St to Wahru St	20	37	0.0	4.5	308	343	463		ଜ			
Wahrut St Bridge		42			•							
Walnut St to Portage St		42										
Portage St Bridge		8					1					
Portage St to S Pitcher		25					•					Γ
S Pitcher Bridge		25										
S Pitcher to RR Bridge 2	220	25		4	815	817	1,222	220	072	36.67	1,259	36,667
RR.Bridge 2	30		0.02	þ 4	111	125	167	30				
RR Bridge 2 to RR Bridge 3	675			3.6	2,188	2,500	3,281	675	9/9	98.44	3,380	100,000
RR Bridge 3	30			3.6	26	111	148	30		4.38	150	4,444
RR Bridge 3 to RR Bridge 4	150			3.5	486	959	729	150	150	21.88	751	22.22
RR Bridge 4	30		0.02	3.5	97	111	146	30				
RR Bridge 4 to E'Michigan	400		0.28	3.5	1,556	1,778	2,333	400	400	70.00	2,403	71.111
E Michigan Bridge	87	15	0.03	3.6	169	183	254					
E Michigan St to Confluence	250	51	0.28	3.5	1,653	1,889	2,479	250	250	74:38	2,554	75,556
	2804		3.14		16,413	18.942	24,619	3,923	3,783	707.70	24,298	726,811

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	100	enio io oti	1	Contain 140 Foreston	MARGA
MOBILIZE DREDGING SUB TO FIRST AREA	9	-	<u> </u>	GEN TASK DETAIL	Cost to Mobilize Initially to the Project. Cost used to estimate mobilization expenses for subcontractor for each ordine.
LEADING COEW COST	8		a a	GENTASK DETAIL	Innomication expenses to success the earl option. Bally cost for removal of trees and other vegetation from greas to be
AFCHANCAL DEFICING CREW	5		ě	GEN TASK DETAIL	Daily cost for 1 day production from a Mechanical Dredging Crew.
SOLIDIFICATION COSTS	35	-	No	GEN TASK DETAIL	cost pasarines perpendiculas excarativa inclinicarius Cost for soludination of 1 ton of dredged sedimentifor transfer to dimembra for TRD
SRIDGE CLEARING RESOURCES	605	-	DAY	GEN TASK DETAIL (PORTAGE)	Daily cost for Horzontal Drill Crew to scrape material from beneath bridges so they can be excavated
WATER HANDLING CREW	809	-	DAY	GEN TASK DETAIL (PORTAGE)	Daily cost for personnel and equipment to collect and treat free water and turbid water generated during dresping
SURVEYING CREW	705	+	DAY	GEN-TASK DETAIL (PORTAGE)	Daily cost for confirmation that sediment has been removed and to levout new dreduing areas.
STREAM RESTORATION COST	809	100	<u></u>	GEN TASK DETAIL (PORTAGE)	Cost to replant areas after dredging is complete. Includes area adjacent to stream only x 30 ft layback
AOT COST	889	-	LS.	GEN TASK DETAIL (PORTAGE)	Cost to generale and negotate one Maintenance of Traffic permit for performance of workwork
AONITORING RESOURCES COST	610	-	DAY	GEN TASK DETAIL (PORTAGE)	Air monitoring, water quality monitoring, sampling and analysis per day in field. Monitoring labor included on PM Resources costs
rad cost (TSCA)	G11	8	NOT	GEN TASK DE TAIL (PORTAGE)	Cost to ship 1 ton to TSCA Disposal
(BD Cost (non-TSCA)	G12	20	NOT	GEN TASK DETAIL (PORTAGE)	Cost to ship 1 ton to Subtitle D Disposal
REMOB TO NEW AREA COST	G13	-	S	GEN TASK DETAIL (PORTAGE)	Local recognitioning of equipment to new work area
ACCESS AGREEMENT NEGOTIATION	G14	-	r.s	GEN TASK DETAIL (PORTAGE)	Cost to generate and negotiate one Access Agreement for performance of workwork
GOWATER TREATMENT OF FREE WATER	G15	4,000	TVO	GEN TASK BETAIL 2 (PORTAGE)	Cost to collect and transport free water collected in watertight boxes to disposal
SHIFT DREDGING EQUIPMENT	G18	1	ST.	GEN TASK DETAIL 2 (PORTAGE)	Cost to shift Dredging Equipment to new area
yor Used	N/A	0	, AW		
yor Used	NA	0	N/A		
int Used	NA	0	AIN		
Vot Used	N/A	0	VÄ		
Pesd Ved	NA	0	VIN		
voi Used	N/A	0	V/N		
Vot Used	NA	0	W/A		
Vol Used	N/A	0	NA		
Vor Used	K.	0	N/A		
Used	¥.	o,	N/A		
DESIGN and PROJECT MANAGEMENT RESOURCES	M			PM RESOURCES (FAWN DREDGE)	Estimated Design and Oversight Resources

PROJECT ROM TASK UNIT RATE ESTIMATE SUMMARY Portage Creek Mechanical Dredging Class 4 Rough Order of Magnitude Estimate Kalamazoo, MI

ROM ESTIMATE DISCLAIMES

This estimate has been developed and provided as an Order of thingstade Battmate (RDN)/Budgetary Battmate and as such is estable for the purpose of hedget development modes planning only. This cuttmate is offered as an epinion of cost to porture the work and is not an effer to contrast for construction services, presure and/or provide much services.

itam No.	Task Description	UOM	Quantity	Estimated Cost (USD)	Est Production Rate	Production Rate Unit	Unit Rate for Cost Calc	Unit
G01	MOBILIZE DREDGING SUB TO FIRST AREA	LS	1	\$ 28,728	\$ 1°.	LS	\$ 20,728	LS
G02	CLEARING CREW COST	DAY	1	\$ 7,188	\$ 100	LF/day	\$ 71.38	\$A.F
G03	MECHANICAL DREDGING CREW	DAY	1	\$ 3,542	\$ 100	cylday	\$ 35,42	\$/CY
G04	SOUDIFICATION COSTS	TON	1	\$ 3,020	\$ 180.00	ton/day	\$ 20.19	\$/ten agent
Q05	BRIDGE CLEARING RESOURCES	DAY	1	\$ 8,011	\$ 50	cylday	\$ 160.23	SICY
G06	WATER HANDLING CREW	DAY	. 1	\$ 2,412	1	day	\$ 2,411.85	\$/0a)
G07	SURVEYING CREW	DAY	1	\$ 2,688	8 1	day	\$ 2,888	\$/Day
GOS	STREAM RESTORATION COST	LF	100	\$ 10,083	\$ 100	M/day	\$ 100.83	\$/LF
G09	MOT COST	LS	1	\$ 8,441	3 1	LS	8 9,441	LS
G10	MONITORING RESOURCES COST	DAY	1	\$ 4,575	8 7	Day	\$ 696	\$/Day
G11	TAD COST (TSCA)	TON	20	\$ 3,881	\$ 20	ton	\$ 179.06	\$/Ten
G12	T&D Cost (non-TSCA)	TON	20	6 828	\$ 20	ton	\$ 26.25	\$/Ton
G13	REMOB TO NEW AREA COST	LS	1	\$ 5,630	1	LS	\$ 5,630	LS
G14	ACCESS AGREEMENT NEGOTIATION	LS	t	\$ 14,375	\$ 1,00	LS	\$ 14,378	LB
G15	TADAWATER TREATMENT OF FREE WATER	GAL	4,000	\$ 1,800.00	\$ 4,000.00	لحو	\$ 0.48	\$/Gel
G16	SHIFT DREDGING EQUIPMENT	L8	1	\$ 6,200,00	\$ 1,00	LB	\$ 6,200	LS
								-

7/12/2010 16:11 OST BUILDUP DETAILS hanical Dredging Class 4 Rough Order of Magnitude Estimate

ROSS EDTUMATE DISCLARICER

ot include CH2M-HILL-effort estimates or Means data as indicated ed on Davis-Bacon rates for Kalamazoo, MI püons Tab for Scope Details

DAVIS BACON WAGES						
		Rate		꿆		
Operator (All)	\$	30.12	2	17.80		85.11
Operator OT (All)	\$	45.18	\$1	8.78	**	58.75
Labor (AB)	\$	20.57	*	8.88		35.02
Labor OT (All)	\$	30.86	y.	4.63		40.81
Electrician ST	\$	30.00	*	15:02		51.77
Electrician OT	\$	45.00	\$	15.47		69.54
Plumber ST	\$	30.50	\$	14.10	•	51.29
Plumber OT	\$	45.76	\$	21.15	8	76.94
Cerpenter ST	\$	23.28	\$	11,15	\$	38.57
Carpenter OT	*	34.89	\$	16.73	\$	59.36
	l		Ì			

NOTE OF THE PROPERTY OF THE PR	No est late	41	1	Production	41	Unit Rate for
	AC OF CIRES		Cost	Rate		Cost Calc
DGING SUB TO FIRST AREA	-	61	\$ 38,728	-	S.I	\$ 38,728
ilize initially to the Project. Cost used to estimate expenses for subcontractor for each option.	·		:		,	
EWCOST	-	DAY	\$ 7,188	100	LF/day	\$ 71.88
r removal of trees and other vegetation from areas nically Dredged.						
DREDGING CREW	1	DAY	\$ 3,642	100	cylday	\$ 36.42
r 1 day production from a Mechanical Dredging assumes perpendicular excavation from banks.						
)N COSTS	-	TON	3,029	150.00	ton/day	\$ 20.19
Iffication of 1 ton of dredged sediment for transfer (for T&D)						
RING RESOURCES		AVO	\$ 8011	09	cvídav	180
r Horizontal Drill Crew to scrape material from. ges so they can be excavated						
ING CREW	- -	DAY	\$ 2442	- 1-	dev	2 2 442
r personnel and equipment to collect and treat free rold water generated during dradging						ļ .
REW	-	DAV	2 885	1-	dav	2 288
r confirmation that sediment has been removed t new dredging areas						
ORATION COST	100	5	10.083	100	Widay	\$ 100.83
ant areas after dredging is complete. Includes area stream only x 30 ft tayback						
	-	ទា	18. 9.441		প্র	\$ 9.441
rate and negotiate one Maintenance of Traffic rformance of workwork						
		.				

AGE) 4 ROM (7-07-10) v2 (fer djc) (version 1),xlab

	+ 1						
ESOURCES COST	•	AVG	\$ 4,875	1	Day	4	3
i, water quality monitoring, sampling and analysis d. Monitoring labor included on PM Resources							
							Ţ
(A)	20	TON	3,581	8	ğ	64	8
ton to TSCA Disposal							T
							Ţ
78CA)	20	TON	\$ 525	2	fam	9	8
ton to Subtitle D Disposel							T
							T
V AREA COST	-	87	\$ 630		87	4	6 625
oning of equipment to new work area							Ī
							Ţ

AL TASK DETAILS

GING SUB TO FIRST AREA										
	Description	Resource Description	No of Units	Unit Rate	Units	Add Units	Unit Description	Raw Cost	Contractor Markuo	Confractor M
TUP										Amt
Contractor	Mob Dozer/IT/28	D-5 bozer	1	\$ 500.00	\$vrip	-	Day	\$ 500.00	25.0%	
Contractor	Est. Clear and Grade Access Road	D-5 Dozer	1	\$ 350,00	\$/day	-	Oay		25.0%	
	Est.	Purchase and install geotextile	0009	\$ 0.05	\$/\$	-	1		25.08	
Contractor	Est. Access Road Stone Purchase	Purchase Stone - 500 ft x 12 ft wide - 6 in #3 stone	165	-	torus	1		7	25.0%	
Contractor	Est. Place Stone	Stone Pfacement Equipment	1	\$ 350,00	\$/day	-	2	35000	25.00	
Contractor	Est. Labor Expense	Operator ST	8		\$/hr	3		1,322.59	25.0%	
Contractor	Est. Labor Expense	Operator OT	4	}	#\/\$	F.	Ī		25 (194	
Contractor	Est, Labor Expense	Labor ST	32	\$ 35.02	\$/hr	3			25.0%	
Contractor	Est, Labor Expense	Labor OT	16	18'07	\$/hr	3			25.0%	
Contractor	Est, Labor Expense	Perdiem	4	\$ 150.00	\$/day	3			25.0%	
Contractor	Est. Labor Expense	Truck	2	\$ 75.00	\$/day				25.0%	
Contractor	Est. Construct Load relay area	2 x 6, 60 mil liner, pumps, etc		\$ 1,500.00	ST	ı	Ę	-	25.0%	
storage tank	Est.	1,000 gal mobile tank and pump, Rain for Rent		\$ 500,00	\$/trip	-	P.B	\$ 500.001	25.0%	
Contractor	Est. Purchase Sediment Curtain	50 ft x 5 ft, 2 ea downstream	4	\$ 1,000.00	\$/event	-	\$	4.000.00	25.0%	
Contractor	Est.	Board Mats	10	\$ 550,00	Allowance		T		JE DE	
Contractor	Est,	Misc	1	\$ 200.00	\$/day		2		25.02	
Contractor	Est,	Fuel	50	3,25	\$/gal	E1			25.0%	44
		,								
Contractor	Mobiliono Stick: Excavator	35, 40								
		075 187		\$ 1,000,00	diny	. 1	Day	1,000.00	25.0%	₩.
Contractor	Mob Environmental Bucket	2.cy	1	\$ 1,000,00	SVrip	-	Dáy	1,000.00	25.0%	•
Joxes	Sub to fabricate boxes	25 cy, no rear door	3	\$ 500,00	\$/frip	1	BE .	1,500.00	25.0%	
principal	CAT 302		2		\$voip	1		ľ	25.0%	
princip	Mbdng Attachment		-		du/s	1			25.0%	
M Tollian			•	\$ 120,00	\$vtrip	1	æ	\$ 860.00	25.0%	-
								27 00000		

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.GE) } ROM (7-07-10) v2 (ler djc) (version 1).xlsb

W COST										
	Description	Resource Description	No of Units	Unit Rate	Units	Add Units	Unit Description	Raw Cost	Contractor G&A Contractor GA	Contractor Gi
ontractor	Shift Tree Prunig/Crew	4 man crew, highlift, grappler, chalmans, etc.	1	\$ 250.00	EA	1	Dely	\$ 250,00	25.0%	
ontractor	Tree Prunig Crew - Assume 100 d man crew, highlift, grappler, If /day production chainsaws, etc.	4 man crew, highlift, grappler, chainsaws, etc.	1.	\$ 4,500.00	\$/dey	1	Day	\$ 4,500,00	25.0%	\$
onfractor	T&D of Pruning Waste	Assume all chipping and wood free, Assume 1 load per day to disposal	20	\$ 50.00	\$/0	-	And	00'000'1 \$	25.0%	•
								\$ 6,760,00		1,

DREDGING CREW										
	Description	Resource Description	No of Units	Unit Rate	Units <	Add Units	Unit Description	Raw Cost	Contractor G&A	Contractor GA
n Contractor	Long Stick Excavator	Cat 320	1	00°005 \$	\$/day		Day	\$ 500.00	25.0%	
n Contractor	Environmental Bucket	2 cy		\$ 250,00	\$/day	-	Day	\$ 250.00	25.0%	s
	Est. Delivered Price	25 cy	7	30,00	\$/day	1	Day	\$ 60.00	25.0%	•
n Contractor	Est. Labor	Operator ST	8	\$ 55.11	\$/hr	1	Day	\$ 440.88	25.0%	•
n Contractor	Est. Labor	Operator OT		\$ \$2.75	\$/hr	1	Day	\$ 239.00	25.0%	•
n Contractor	Est. Labor	Labor ST	8	Z0'SE \$	\$/hr	1	Day	\$ 280.14	25.0%	*
n Contractor	Est, Labor	Labor OT	4	\$ 40.81	\$/hr	1	Day	\$ 163.22	25.0%	9
n Contractor	Est. Labor	Perdlem		\$ 150.00	\$/day	1	Day	\$ 300.00	25.0%	8
n Contractor	Est. Labor	Truck	1	\$ 75.00	\$/day	1	Day	\$ 75.00	25.0%	•
n Contractor	E.	Misc		\$ 200:00	Asp/\$	1	Day	\$ 200.00	25.0%	•
n Contractor	Est.	Fuel	100	3.25	leg/‡	1	Day	\$ 325.00	25.0%	s
								\$ 2,833.23		•

sy production from a Mechanical Dredging Crew. Cost assumes perpendicular excavation from banks on rate of 100 cy/day

)N COSTS										
	Description	Resource Description	No of Units	Unit Rafe	Critts	Add Units	Unit Description	Raw Cost	Contractor G&A	Contractor Gt
n Contractor	Est. Purchase SAP cement mix © 3% of dredged mass - 150 cy/day x 1.5 = 225 tons/day; 225 tons/day x .03 = 6.75	Mp. In watertight boxes; load to trucks for transport to disposal	4.5	\$ 1,200,00	ua/\$	1	RP PER PER PER PER PER PER PER PER PER P	\$ 5,400.00	25.0%	
n Contractor	CAT 302		1	\$ 250.00	\$/day	1	Chay	\$ 250.00	25.0%	•
n Contractor	Moding attachment		1	\$ 150.00	App/\$	1	ÁBO	\$ 150.00	25:0%	5
n Contractor	Est. Labor	Operator ST	8	\$ 55.11	14/\$	1) Asi	\$ 440.86	25:0%	*
n Contractor	Est. Labor	Operator OT	4	\$ 59.75	\$/hr	1	(Pay	\$ 239.00	25.0%	•
n Contractor	Est. Labor	Labor ST	8	35.02	\$/hr	1	Aled	\$ 280.14	25.0%	•
n Contractor	Est. Labor	Labor OT	4	\$ 40,81	\$/br	1	Day	\$ 163.22	25.0%	*
n Contractor	Est. Labor	Perdlem	2	\$ 150.00	\$/day	1	Day	\$ 300.00	25.0%	•
n Contractor	Est. Labor	Truck	1	\$ 75.00	\$/qax	-	Aed	\$ 75.00	26.0%	**
n Contractor	St.	Misc	1	\$ 200.00	\$/day	1	(Jesy	\$ 200.00	25.0%	•
n Contractor	Est.	Fuel	100	37.5	P6/\$	1	Day	\$ 325.00	25.0%	•
							-			
								\$ 7,823.23		-
			3							

tion of ition of dradged sediment for transfer to dumptruck for T&D abon of 150 tons/day @ 10% and bulk density of 1.5 tons/cy

ING RESOURCES										
	Resource	Resource Description	Quantity	Unit Rate	Units	Add Units	Unit Description	Cost	Contractor G&A	Contractor G
ning Contractor	Est Labor	Operator ST	8	\$ 55.11 \$Ahr	\$Pr.	1	Day	\$ 440.86	25.0%	4
ning Contractor	Est Labor	Operator OT	4	\$ 59.75 SMrr	Shi.	1	Day	\$ 239.00	25.0%	4
ning Contractor	Est Labor	Labor ST	16	\$ 35.02	\$/hr	1	Day	\$ 560.28	25.0%	
ning Contractor	Est, Labor	Labor OT		\$ 40.81	- Lys	ī	Day	\$ 326.45	25.0%	
ning Contractor	Est Labor	Perdem	3	\$ 150.00	\$/qax	1	Day	\$ 450.00	25.0%	4
ying Contractor	Est. Labor	Truck	2	\$ 75.00	\$/day	1	Dav	150.00	25.0%	
ving Contractor	Est	Misc	1	\$ 200.00 \$/day	//day	1	Day	200.00	25.0%	
ring Contractor	Est	Fuel	20	3.25	\$Voe	1) And	182 60	25.08	
ning Contractor	Hortzontal Drill		#	2,500,00	\$/day	1	2	2 500 00	25.05	
ning Contractor	Flexifloats		1	\$ 800.00	*/day	1	dav	800.00	25.0%	•
ning Contractor	Drill Bucket Rental		. 1	\$ 100.00 \$/day	/dey	1	day	100.00	25.0%	64
ning Contractor	Crane	Operated, On call, ave 4 hours/day	4	\$ 120.00 \$/hr	/hr	1	day	\$ 490.00	25.0%	
								\$ 6,499.09		•

zontal Drill Crew to scrape of 50 cylday

ING CREW						i				
	Resource	Resource Description	Quantity	Unit Rate	satus	Add Units	Unit Description	Coat	Contractor G&A	Contractor G
trol Labor	Est. Collect Free Water From Mbx Tanks	Operator ST	60	\$ 55.11	\$/hr	1	day	\$ 440.86	25.0%	
trol Labor	Est. Collect Free Water From Mix Tanks	Operator OT	4	\$ 59.75	\$/hr	1	day	\$ 239.00	25.0%	
trol Labor	Est. Collect Free Water From Mix Tanks	Labor ST	6 0	\$ 35.02	\$/hr	1	day	\$ 280.14	25.0%	
trol Labor	Est, Collect Free Water From Mix Tanks	Labor OT	4	\$ 40.81	\$/hr	1	А́ер	\$ 163.22	25.0%	
waning Contractor	Est. Labor	Perdlem	2	\$ 150,00	\$/day	1	Dav	300.00	25.0%	ú
saning Contractor	Est. Labor	Truck	1	\$ 75.00.	\$/day	1			25.0%	
trol Labor	Est. Collect free Water From Mix Tanks	Water Tank Rental, 10,000 gal	ļ -	\$ 175.00	\$/day	1			25.0%	
trol Labor	Est. Collect free Water From Mix Tanks	Vacuum Pump	1	\$ 75.00	\$/day	, i	day	\$ 75.00	25.0%	
trol Labor	Est. Collect Free Water From Mix Tanks	Misc Supply	-	\$ 100:00	\$/Gal	1	day	\$ 100.00	25.0%	
trol Labor	Est. Collect Free Water From Mix Tanks	Fuel	25	\$ 3.25	\$/Gel	1	day	\$ 81.25	25.0%	
			-							
								4 000 40		

onnel and equipment to collect and treat free water and turbid water generated during dredging

LEW .										
	Resource	Resource Description	Outsidity	Unit Rate	Units	Add Units	Unit Description	Çest	Centractor G&A	Contractor GI
: Surveyor	Two-man Survey Crew	Standard Time	9	150.00	ŧ	1	dav	1 200 00	25.0%	-
: Surveyor	Two-man Survey Crew	Overtime	4	\$ 225,00	ŧ	1	dav	90,008	25.0%	u
Surveyor	Data Processing		1	\$ 75.00	±	-	Aep	75.00	25.0%	
: Surveyor	Project Management		1	\$ 108.00	ŧ	1	day	108.00	25.0%	
Surveyor	Per Diern		0	\$ 150.00	λęς	1	day		25.0%	
	Supplies/stakes, etc.		1	\$ 25.00	À	1	, day	\$ 25.00	25.0%	
: Surveyor	Surveyor Mob/Demob Cost	2 days/week	0	\$ 200,002	g.	1	qax		25.0%	
								2308.00		

Contractor Fig. Replace Tree 7.5 - 3" Oak Quantization Contractor Fat. Replace Tree 2.5 - 3" Oak Color C	Documo Describation	_						
Est. Replace Trees 2.5 - 3" Oak Purchase Sod	_	Unit Rate	Units	Add Units	Unit Description	Cost	Contractor G&A	Contractor Ga
Purchase Sod Purchase Sod Puch 2,5 - 3" Oak 10	\$ 300:00	EA	ı	EL.	\$ 3,000.00	25.0%		
Fuel Fuel Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees	3000	1.25	Js/\$	1-	E	3,750.00	25.0%	
Fruel Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees		\$ 175.00	/kep/\$		80	175,00	25.0%	
Est. Replaca Trees Est. Replaca Trees Est. Replaca Trees Est. Replaca Trees Est. Replaca Trees Est. Replaca Trees Est. Replaca Trees	20	3.25	#/gel	1	Bu	\$ 65.00		**
Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees	Operator ST 8	\$ 55.11	\$/hr	1	ē.	\$ 440.88		**
Est. Replace, Trees Est. Replace Trees Est. Replace Trees Est. Replace Trees	Operator OT	\$ 59,75	\$/hr	1	na	8	25.0%	
Est. Replace Trees Est. Replace Trees [Est. Replace Trees	Labor ST 16	\$ 35.02	\$/hr	1	eu	\$ 560,28	25.0%	
Est. Replace Trees Est., Replace Trees	Labor OT 0	\$ 40.81	\$/hr	1	, na	•	25,0%	
Est, Replace Trees	Perdiem . 0	\$ 150.00	\$/day	1	ē.	•	25.0%	**
	Truck 1	\$ 75.00	\$/qax	-	20	\$ 75.00	26.0%	
						\$ 8,066,14		3

eas after dredging is complete. Includes area adjacent to stream only \times 30 ft layback storation of 100 LF of stream/day set and may changed based on finel design requirements

	Resource	Resource Description	Quantity	Unit Rate	Unite	Add Units	Unit Description	55	Contractor G&A	Contractor Gu
hant	Labor	MOT Ragmen	8	\$ 19.41	\$/hr	01	dey	\$ 1,553.07		
ftant	Permit Application Prep		1	00'000'5 \$	per incident	1	day	\$ 5,000.00	25.0%	•
ftant	Equipment/Signs		1	1,000.00	per incident	1	day	1,000.00	25.0%	•
		4								
								\$ 7,563,07		-

and negotiate one Maintenance of Traffic permit for performance of workwork

Resource Lab Weekly Metals (Water) Lab Weekly PCB (Water) Lab Weekly Dup Lab Weekly MS Lab Weekly MS Lab Weekly MS Lab Weekly MS Lab Weekly MSD Alf Weekly MSD		-						
Lab Weekly Helals (Water) Lab Weekly Dup Lab Weekly Dup Lab Weekly MS Lab Weekly MS Lah Weekly MS Art Monttons/Turbidity Monitons	Description Quantity	Unit Rate	Units	Add Units	Unit Description	Cost	Contractor G&A	Contractor G
Lab Weekly PCB (Water) Lab Weekly Dup Lab Weekly MS Lah Weekly MSD Lah Weekly MSD Air Monitors/Turbidity Monitors	130	1:00 \$ 300.00	ea	1	day	300.00	25.0%	
Lab Weekly Dup Lab Weekly MS Lab Weekly MSD Art Wenkty-MSD Art Monitors/Turbidity Monitors	1.0	1.00 \$ 900.00	8	1	day	00'006	26.0%	••
Lab Weekly MSD Lab Weekly, MSD Air Monitors/Turbidity Monitors	1.0	1.00 \$ 300,00	88	1	day	\$ 300.00	25.0%	-
Lati Weetby MSD AIr Honfors-Turbidky Monfors	1.0	30000	ea	1	day	300.00	25.0%	
Air Monitors/Turblaky Monitors	1.0	1.00 \$ 300.00:	ea		day	\$ 300.00	25.0%	•
	1.5	2.00 \$ 50.00	2	7	Аер	\$ 700.00	25.0%	
y Lab Sample Collection		8,00 \$ 75.00	63	1	day	\$ 600.00	25.0%	
Y-Lab Packaging and Shipping		2,00 \$ 250.00	8	1	day	\$ 500.00	25.0%	
						3,900,00		*

ster quality monitoring, sampling and analysis per day in field. Monitoring labor included on PM Resources costs

:A)			!							L
	Resource	Resource Description	Chantity	Unit Rate	Uritta	Addi Units	Unit Description	Cost	Contractor G&A	Contractor 64
ion	Est. Transport to EQ	20 ton min	20	\$ 35.00	\$/ton	-	22	\$ 700.00	25.0%	8
Contractor	Est. Transport to EQ	Uner	1,	\$ 65.00		1	an and	\$ 65.00		
	Est. TSCA Disposal	Minimal stabilization and disposal	70	\$ 100.00	*/ton	-	g.	\$ 2,000.00		
	Est. TSCA Disposal	Misc Absorbent/load	1	\$ 100,00	\$/load	-	EL	100.00	25.0%	5
								\$ 2.885.00		4

to TSCA Disposal

rsca)										
	Resource	Resource Description	Quantity	Unit Rate	Units	Addl Units	Unit Description	Cost	Contractor G&A	Compractor GI
u(Est. Transport to Emelle Ala	20 ton min	20	\$ 5.00	S/ton		2	100.00		
>ontractor	Est. Transport to Emelle Ala	Liner		\$ 25.00	Mond	1	2		25.0%	4
	Est. TSCA Disposal	Minimal stabilization and disposal	R	15.00.	\$Aton	1	2		25.0%	•
	Est. TSCA Disposal	Misc Absorbent/load	-	\$ 100.00	\$/load	1	8 80	100.00	25.0%	
								\$ 525.00		-

to Subtitle D Disposel

V AREA COST										
	Resource	Resource Description	Quantity	Unit Rate	Units	Addi Units	Unit Description	Cost	Contractor G&A	Contractor Of
Contractor	Reset Load Relay Area - materials cost	Reset board mats; Construct new relax area	1	\$ 1,500.00	\$/reset	-	er.	\$ 1,500.00	25.0%	
Contractor	Reset Load Relay Area - materials cost	Cat 305 Excavator	-	\$ 275.00	\$/day	-	day	\$ 275.00	25.0%	
Contractor	Reset Load Relay Area -	Gravel Purchase and Placement	20	\$ 15.00	\$/ton	-	e L	\$ 750.00	25.0%	
Contractor	Reset Load Relay Area - Imaterials cost	Operator ST	•	\$ 55.11	\$/hr	1	day	\$ 440.86	25.0%	
Confractor	Reset Load Relay Area - materials rost	Operator OT	*	\$ 59.75	\$/hr	-	day	\$ 239.00	25.0%	
Contractor	Reset Load Relay Area -	Labor ST	16	\$ 35.02	\$/hr	1	day	\$ 580.28	25.0%	
Contractor	Reset Load Relay Area -	Labor OT	6	\$ 40.81	\$/hr	1	day	\$ 326.45	25.0%	•
Contractor	Reset Load Relay Area - materials cost	Fuel	50	\$ 3,25	\$/Gal	÷	Asp	\$ 162.50	25.0%	
Tank	Reset Load Relay Area - materials cost		. 1,	\$ 250,00	\$/shift	1	2	\$ 250.00	25.0%	
]

if of equipment to new work area of it of stream

7/12/2010 16:11 SOST BUILDUP DETAILS chanical Dredging Class 4 Rough Order of Magnitude Estimate

ROM RETURATE DISCLAIMER

not include CH2M¹HILL effort on estimates or Means data as indicated ased on Davis-Bacon rates for Maricopa County, Arizona mptions Tab for Scope-Detaits

DAVIS BACON WAGES						
	Rate		FR	3		Total
Operator (AS)	\$	30.12		17.80		56.11
Operator OT (All)	\$	45.18	\$	8.78	s	59.76
Labor (All)	\$	20.57	\$	9.88		35.02
Labor OT (Atl)	\$	30.88	\$	4.63	•	40,81
Electrician ST	\$	30.00	*	15.02	•	51.77
Electrician OT	\$	45.00	\$	15.47	\$	69.54
Plumber ST	\$	30.50	\$	14.10	••	51.29
Plumber OT	•	45.75	\$	21.15	•	78.94
Carpenter ST	\$	23.26	\$	11.15	ę.	39.57
Carpenter OT	\$	34.89	\$	16.73.	**	59.36

SCRIPTION	No of Units	Unk	Cost	Production Rate	Unit	Unit Rate for Cost Calc
REEMENT NEGOTIATION nerate and negotiate one Access Agreement for	1	\$1	\$ 14,376	1	នា	\$ 14,376
TREATMENT OF FREE WATER lect and transport free water collected in watertight isposel	4,000	GAL	\$ 1,800	4,000	- E- B-	\$ 0.46
GING EQUIPMENT If Dredging Equipment to new area	1	§1	\$ 6,200		ST	\$ 6,200

T DREDGING ESTIMATE DETAILS

EMENT NECOTIATION	-								
	Days to Complete	0							
	Description	Resource Description	No of Units	Imt Date	100				
Ty'Legal	Est	The Country of		CHIR PARE	Unite	Add Crits	Unit Description	Rank Cont	TOWNS
			9	100,001	\$/hr	•			No.
	Est.						2	4,000.00	•
rty Legal	279		7	\$ 2,500:00	\$/hr	_	80	6000.00	
		Sr Review	œ	250.00	**		2	3,000,00	•
	Fet			4	\$√nr	_	2	S COMPONE	
		Copies, ect	_	500 00	ť			20.000	•
				20:000	Ga Ga	-	2	500.00	4
				1					

The second of the second secon			•						
SEATMENT OF FREE WATER	Days To Complete	ē							
	Description							-	
	Handi Nessa	Resource Describation	No of Units	(Infe Rate	Harber	A 44 41 11 11			
andling Contractor		Of the Verning Tenate, 100 -ul-		OHIV THE PARTY	CHILD		Call Description	Man Cost 120MTDA11	CONTRACT
	ESt. Collect and Transport Water 1 20 cm. account much, 100 mile	THE THE PARTY INC. TO THE	: «	90.00					
andling Contractor		Salins		20:00	Ju/s		Ag.	. F40 00	
TOTAL TOTAL CONTRACTOR	Est. Disposal Cost		ADDO	*				20:010	•
			2004	0.20	leg/\$	-	veh	000000	
							1	00:000	
									•

nd transport free water collected in watertight boxes to disposal north

ANG EQUIPMENT	Dava To Complete								
	mardings of order	0							
	Description	Resource Description	No of Units	ifult Date	1	7.71		ľ	
					COMP	Add Units	Unit Description	Raw Cost	CONTRACT
The chart of the c						0	Pu		
	Mobitong Stick Excavator	Cat 320	-	\$ 500.00	Chris				
					dina	-	- C-	\$ 500.00	
	Mob Environmental Bucket	2.04	-	\$ 500.00	SArin				
t Boxes	C. h to fall dank in	1 1			}	•	, Day	\$ 500.00	•
	SUD 10:14 DUCATE: DOX 65	25 Cy, no rear door	m	500.00					
urpment	CAT 302		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	20:005	n A	1	25	1,500.00	•
ulpment	Mixton Attachment		,	\$ 500.00	\$/trip		62	4.000.00	
			-	200.005	CArio			20.000	
uibment	Crane			2000	dina	1	25	\$ 500.00	•
			æ	\$ 120.00	\$/brip	-	Ę	080.00	
								2000	

Attachment C Takeoff Information

ORTAGE CREEK TAKEOFF INFORMATION

ROJECT DRAWINGS and SKETCHES Used in this ROM

Please refer to "Portage Creek Estimation of Volume of Contaminated Sediments and PCB:Mass from 2008 Sampling", Field Environmental Decision Support, 2010 Dredging Area Lifts.pptx

HOW ESTIMATE DISCLAIMER

s ordinante hais been développed and providéed as ais Order of pathole Belhanto (ROB)/Bellopholetry faithmes and as seek his satisfies patholes Belhanto (ROB)/Bellopholetry faithmest and as seek his satisfies for being development formitre planning outs. This means his offered as as options of deat to perform the work and to achieve to contrast for oversitroution services, procure and/or provides

fass Balances of Dredge Material

ENERAL MASS BALANCE ASSUMPTIONS

		Est Mass	(tons)	279	=	486	32	582	218	82	8		2328	153	6.942	708	3.683	313	1.685	213	4 477	1,050	3.485	834	5,523	406	1,276	226	1.408	ই	5.476	5	3.803	80 <u>C</u>	2.838	
83	+out	Sediment	Volume (cy)	186	1	324	21	374	145	6	130		1,552	102	4,628	472	2.456	208	1,123	142	2.985	200	2,310	554	3,682	271	920	150	938	69	3,650	69	2,536	338	1,891	40
PRELIMINARY DISTANCES, WIDTHS, DEPTHS and VOLUMES	EstAve	<u></u>	Depth (ft) Vo	0.5	0.5	0.5	0.5	0.71	0.71	0.71	0.71	0	2.25	6	4.25	4.25	4.25	2.1	9	7	4.5	6.25	5.5	5.5	5.5	4.5	, 2.76	2.5	2.5	2.5	2.6	2.5	E.	3.5	3.5	
3, WIDTHS, DEP		Surface Area	(acre)	0.23	0.01	07.0	9.03	0.33	0.13	0.02	0.11	0.03	0.43	0.02	79.0	20:0	0.36	90:0	0.23	70 .0	0.41	20:0	0.26	90.0	0.41	0.04	0.19	0.04	0.23	0.05	0.91	0.02	0.45	90:08	0.33	200
ARY DISTANCES		Stream Width	(# #/-)	20	20	20	20	20	20	20	20	20	20	20	30	30	40	64	28	33	37	42	42	34	25	25	25	25	25	25	.25	25	30	30	51	
PRELIMIN		Stream Distance	(# #/·)	503	8	875	88	21.2	276	37	248	29	831	46	086	100	330	29	361	99	787	72	270	08	723	\$	334	92	405	8	1877	30	652	87	286	OBBOT
	,		Location	Alcoft St to Bryant St Bridge	yant St Bridge	yant St to Reed Ave	ed Ave Bridge	sed Ave Bridge to Reed Ct Bend	sed Ct Bend to RR Bridge 1	3 Bridge 1	3 Bridge 1 to Stockbirdge	ockbridge Bridge	ockbridge to Lake St	ike St Bridge	ike St to E Crosstown Pkwy	Crosstown Pkwy Bridge (2 x 6.ft corrugated).	Crosstown Pkwy to E Vine St	Vine St Bridge	Vine St to E Dutton St	Dutton St Bridge	Duffon St to Walnut St	shut St Bridge	athut St to Portage St	ortage St Bridge	ortage St to S Pitcher	Pricher Bridge	Pitcher to RR Bridge 2	< Shage 2	A Bridge 2 to RR Bridge 3	< Bridge 3	KiBridge 3 to RR Bridge 4	- Bridge 4	Ridge 4 to E Michigan	Michigan Bridge	Michigan St to Confluence	

		Dd.Mdd 08	NO PPINIPOR REMOVAL CHECK	4FCK								
		8		Est Ave	Est	Total +		Clearing For			Est Disposal	Est Free Water
Location	Stream Distance (ft +/-)	Stream Width	Surface Area (acre)	Depth (ft)	Volume (cy)	Overdredge (oy)	(tons)	Mechanical Dredge (if)	Site Agen Restoration (if) Amt	Agent Blend Amt (ton)	Mass (ton)	Generation (gal)
				1						1		
oott St to Bryant St Bridge							•					
of St Bridge												
nt St to Reed Ave					,] ,					
d Ave Bridge							•					
J Ave Bridge to Reed Ct Bend												
1 Ct Bend to RR Bridge 1		_										
3ridge 1												
Sridge 1 to Stockbirdge												
kbridge Bridge												
chridge to Lake St							1					
St Bridge												
St to E Crosstown Pkwy	100		0.07	3.5	389	444	199	100	100	20	687	17 778
osstown Pkwy Bridge (2 x 6 ft comugated)	8	36	0.07	3.5	388	444	199			8	687	17.778
osstown Pkwy to E Vine St	53			3.5	275	314	471	•	53	14	485	12.583
ne St Bridge												
he St to E Dutton St												
tton St Bridge							•					
itton St to Walnut St												
ut St Bridge												
nd St to Portage St												
age St Bridge												
age St to S Pitcher												
cher Bridge												
cher to RR Bridge 2												
Sridge 2												
3ridge 2 to RR Bridge 3												
3ridge 3												
Bridge 3 to RR Bridge 4							-					
3ridge 4							·					
3ridge 4 to E Michigan												
chigan Bridge												
chigan St to Confluence					-	3						
	253		0.19		1,053	1,203	1,804	100	153	54	1,859	48:119

, Va;ues estimated from - Portage Creek Longitudinal Profile - Arcadis 8/21/2008

i. Va;ues estimated from - Portage Creek Estimation of Volumes - Arcadis 6/4/2010

		40 PPM PC	40 PPM PCB REMOVAL CHECK	売C X								
	Stream Distance	Stream Width	Surface Area	Est Ave	Est	Total +		Clearing For			ig ig	Est Free Water
Location	(R +/-)	(4.4-)		Depth (ft)	Volume (cy)	Cy)	(tons)	Mechanical Dredge (If)	Restoration (In Amt	Agent Blend	Mass (104)	Generation
										1	1	(Nag)
cott St to Bryant St Bridge												
unt St Bridge		į.										
ant St to Reed Ave										,		
d Ave:Bridge												
d Ave Bridge to Reed Ct Bend												
d Ct Bend to RR Bridge 1							•					
Bridge 1												
Bridge 1 to Stockbirdge												
Aduloge Bridge												
Aduidge to Lake St	9	20	900	0.5	E	74	33	100	200	100		
s St Bridge	23	20		0.5			3	3	3	1.0	'n	2,963
s St to E Crosstown Pkwy	200	8	0 14	6.		000	4 467	000		3	13	88
osstown Pkwy Bridge (2 x 6 ft corrugated)	100	30		3.5		444	1,10	ANY	2002	8 5	1,202	35,556
rosstown Pkwy to E Vine St	380	04	0.36	25	ľ	23.6	2000			26.71	100	17,778
ne St Bridge	67	4		0.5		00	200,0		OSC OSC	91.00	3,124	92,444
ne St to E Dutton St	75	280		200	3 8	20	2 0			2.23	11	3,970
utton St Bridge				2		9	8		ę	1.75	8	3,111
utton St to Wethurt St												ļ
nut St Bridge		 -										
nut St to Portage St												
age St Bridge												
age St to S Pitcher												
Icher Bridge												
tcher to RR Bridge 2												
Bridge:2												
Bridge 2 to RR Bridge 3												
Bridge 3												
Bridge 3 to RR Bridge 4												
Bridge 4												
Bridge 4 to E Michigan												1
chigan Bridge												
chigan St to Confluence	95	10	0.01	0.5	a	10	14	5	22	8,0		1
								3	8	0.42	4	141
	1005		0.74		3 332	3 834	A 908	350	970	440.05		7,0
							1 20012	Ann	3	140.00	2,148	15/ 244)

Va;ues estimated from - Portage Creek Estimation of Volumes - Arcadis 6/4/2010

		20 PPM PCB REM	3 REMOVAL CHECK	ECK								-
				Est Ave	Est	Total +		Clearing For		· ·	Est Disposal	Est Free Water
Location	Stream Distance (ft +/-)	Stream Width (ft +/-)	Surface Area (acre)	Sediment Depth (ft)	Sediment Volume (cy)	Overdredge (cy)	Est Mass (tons)	Mechanical Dredge (sf)	Site Restoration (ff)	Agent Blend Amt (ton)		Generation (gal)
Icott St to Bryant St Bridge	125	20	90.06	0.5	. 46	83	69	125	125	2.08	7.2	3,704
ant St Bridge			-	•	•		•					
ant St to Reed Ave					•							
ed Ave Bridge												
ad Ave Bridge to Reed Ct Bend	125	10	0.03	0.5	23	48	35.		125	1.0	38	1,852
ed Ct Bend to RR Bridge 1												
Bridge 1												Ī
Bridge 1 to Stockbirdge			•									
ckbridge:Bridge			•									
ckbridge to Lake St	100	20	0.05	4	286	333	444	100	9	13,33	458	13,333
(e St Bridge	23	20	0.01	4	88	111	102				105 105	3,067
te St to E Crosstown Pkwy	425	30	0.29	4	=	2,125	2,833	425	425	ľ	2.918	85,000
costown Pkwy Bridge (2 x 6 ft corrugated)	100	8	0.07	4	444	95	. 199		•	20.00	289	20,000
Prosstown Pkwy to E Vine St	380	9	96.0	4	2,311	2,600	3,467		380		3,571	104,000
ine St Bridge	29	40	90:0	4	387	447	296				613	17,867
The St to E Dutton St	75	87	90'0	4	311	350	487		75	14.00	481	14,000
rutton St Bridge		33	-		•		-					•
outton St to Walnut St		2 E	•		-		-					
hut St Bridge		77	•				•					
thut St to Portage St		77			•		•					
tage St Bridge		34	1		•							
fage St to S Pitcher		97	•		•		•					
itcher Bridge		25			•	4	-					
ticher to RR Bridge 2	200	5 2	0.11	3.5	648	741	872	200	200	29.17	1,001	29,630
Bridge 2		25		3.6								
Bridge 2 to RR Bridge 3	405		0.23	3.6	1,313	1,500	1,969	405	405	90'65	2,028	000'09
Bridge 3	30	52		3.5	26	111	148			4.38	150	4,444
Bridge 3 to RR Bridge 4	125	52		3.5	405	463	809	125	125	18,23	626	18,519
Bridge 4		52		3.5	•		· 1					
Bridge 4 to E Michigan	125	10	0.03	3.5	162	185	243	125	126	7.29	250	7,407
Aichigan Bridge		30	•	3.5	•		•					
Aichigan St to Confluence	50	15	0.02	3.5	26	111	146	9	20	4.36	150	4,444
	2365		1.45		8,509	9,682	12,763	1,555	2,145	382.89	13,146	387,267

		10 PPM PCB RE	BIREMOVAL CHECK	ECK								-
				Est Ave	3	Total +		Clearing For			Bet Dienoga	Est Free
Location	Stream Distance	Stream Width	Surface Area	Sediment	Sediment	Overdredge	Est Mass	Mechanical	Site	#		Generation
			200	AN INCAS	Tall all load	No.	(MOIIS)	Credge (St)	Kestoration (II) Amt	Amt (ton)	(ton)	(gar)
out St to Bryant St Bridge	368	8	0.17	9.0	136	273	2004	388	900	6 43		1000
nt St Bridge					1.			3	866	61.0	711	20.00
nt St to Reed Ave												
(Ave Bridge							1					
Ave Bridge to Reed Ct Bend	175	01	0.0	17.0	46	82	g			70.0	7.4	100
I Ct Bend to RR Bridge 1					ļ.		3 ,		•	70.7		3,13/
3ridge 1					1.							
sridge 1 to Stockbirdge			•		ļ.							
kbridge Bridge					Ţ,		Ţ.					
kbridge to Lake St	200	15	20'0	6	333	389	200			15.00	E4E	45 500
St Bridge	46	20		6	102	119	153			7 80	160	10,000
St to E Crosstown Pkwy	454	25		6	1.281	1471	1 892	454	AEG	26. 26	130	0//10
osstown Pkwy Bridge (2 x 6 ft corrugated)	100	30		3.5	389	444	583	100	F	47.60	1,040	20,002
osstown Pkwy to E Vine St	390	014.		3.5	2.022	2311	3.033	380	300	5 50	2 424	9/1/2
ie St Bridge	19	04	90'0	3.5	78	397	521		200	15.63	51.6	15 004
ie St to E Dutton St	400	28		6	1.244	1.452	1867			20.53	4 633	13,001
tton St Bridge		33								20.00	1,040	100
tton St to Walnut St	93	37	9.0	6	206	240	802	50	2			
ut St Bridge		42							3			
lut St to Portage St		42										
ige St Bridge		34			·							
ige St to S Pitcher		25			,							
cher Bridge		25	1		<u>.</u>							
cher to RR Bridge 2	220	26	0.13	4	815	917	1,222	220	220	36.67	1 250	76.887
kridge 2	30	25		4	111	125	167	30				
Iridge 2 to RR Bridge 3	675	25		_3	1,875	2,188	2,813	675	675	84.38	2 897	87 500
sridge 3	8	25		3	83	48	125	30		3.75	129	3.889
indge 3 to RR Bridge 4	150	25	60'0	3	417	486	625	150	150	18.75	77	19.444
Indge 4	30	25		3	83		125	30				
ridge 4 to E Michigan	300	30	0.21	9	1,000	1,167	1,500	300	300	45.00	1545	46 687
chigan Bridge		30		3	-							
chigan St to Confluence	150	51	0.18	ġ	850	892	1,275	150	150	38.25	1,313	39.667
						-						
	3835		2.38		11,322	13,146.	16,983	2,947	2,757	491.48	16,874	511,230

		6 PPM PCB REI	REMOVAL CHECK	ECK								
			,	Est Ava	1	1						Est Free
	Stream Distance	ŧ	Surface Area	Sediment	Sediment	Overdredge	Est Wass	Mechanical	STE	Agent Blend	Est Disposal Mass	Water
Location	(#+ /·)	(F)	(acre)	Depth (ft)	Volume (cy)	(cx)	(tons)	Dredge (sf)	Restoration (sf) Amt	Amt (ton)		(Bat)
2 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2										_		
Alcour of to prydrit of prigge	9	2	2.5	0.5	138	273	204	368	368	6.13	21.	10,804
Sryant St. Bridge					•		•					
Iryant St to Reed Ave	300	10	20'0	0.5	99	111	83	300	300	2.50	æ	4 444
Reed Ave Bridge			,									
Reed Ave Bridge to Reed Ct Bend	300	9	0.07	0.74	79	125	118			2 66	123	2.970
Reed Ct Bend to RR Bridge 1					,					3	75	0/0/0
R Bridge 1												
R Bridge 1 to Stockbirdge		1			1		,					
Stockbridge Bridge												
Stockbridge to Lake St	931	15	0,32	6	1.552	1.810	2 328			80 83	2 307	77 444
ake St Bridge	94	20	0.02	က	102	119	153			4 60	158	V 770
ake St to E Crosstown Pkwy	086	20	0.45	3.5	2,541	2.904	3.811	980	ORD	114 33		116 148
Crosstown Pkwy Bridge (2 x 6 ft corrugated)	9	æ	0.07	3,5	389	444	583	100		17.50		17 77B
Crosstown Pkwy to E Vine St	390	9	0.36	3.5	2.022	2.311	3,033	390	380	91.00		02 444
Vine St Bridge	29	04	90:0	4	397	447	296			17.87	613	17 AA7
: Vine St to E Dutton St	400	28	0.26	4	1,659	1,867	2,489			74.67	2.5R4	74 667
: Dutton St Bridge		33										
E Dufton St to Walnut St	09	37	90:0	4.5	308	343	463		20			
Malnut St Bridge		42	•									
Mahrut St to Portage St		42			-				-			
ortage St Bridge		35	•									
ortage St to S Pitcher		52							/			
3 Pitcher Bridge		25	•									
3 Pttcher to RR Bridge 2	220	. 25	0.13	4	815	917	1,222	220	220	36.67	1,259	36.667
R Bridge 2	30	25	0.02	4	111	125	187	30				
4R Bridge 2 to RR Bridge 3	675	25	0.39	3.5	2,188	2,500	3,281	675	675	98 44	3,380	100.000
R Bridge 3	30	25	0.02	3.5	28	111	148	æ		4.38	150	4 444
R Bridge 3 to RR Bridge 4	150	25	0.09	3.5	486	258	729	150	150	21.88	751	22 222
R Bridge 4	30	25	0.02	3.5	28	111	146	30				
₹R Bridge 4 to E Michigan	400	30	0.28	3.5	1,556	1,778	2,333	400	400	70.00	2.403	71.111
: Michigan Bridge	87	15	0.03	3.5	169	193	254					
Michigan St to Confluence	250	51	0.29	3.5	1,663	1,889	2,479	250	250	74.38	2,554	75,558
	5804		3.14]		16,413	18,942	24,619	3,923	3,783	707.70	24,298	728,811